DEC STD 092-1 FINISH AND COLOR STANDARD— FINISH STANDARD FOR APPLICATORS

DOCUMENT IDENTIFIER: A-DS-EL00092-01-0 Rev J, 28-Aug-1989

ABSTRACT: This document provides Finish Applicators with a description of Digital's finish numbering system, finish requirements, and method for handling finished parts.

APPLICABILITY: This document is mandatory for all organizations within Digital that produce or procure materials requiring finishes or finished surfaces. This document may be provided to qualified vendors.

STATUS: APPROVED 28-Aug-1989; type $VTX SMC for expiration date.

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1 INTRODUCTION

1.1 PURPOSE

This section of DEC STD 092 defines the requirements that finishes must meet to be qualified for use on Digital products. Personnel responsible for applying finishes to Digital products are herein referred to as *finish applicators* and must adhere to the requirements of this standard.

1.2 SCOPE

This standard defines the Digital finish numbering system, finish requirements, and method for handling finished parts.

1.3 RESPONSIBILITIES

1.3.1 Coating Material Suppliers

Suppliers of coating material are responsible for providing material that meets the requirements of *DEC STD 092-2 Finish and Color Standard— Finish Material Standard for Suppliers*.

1.3.2 Finish Applicator

Finish applicators are responsible for supplying product that meets the requirements of this standard, the appropriate finish specification, and the applicable part drawing.

In the case of conflicting documents, the part drawing shall take precedence, followed by the finish specification, and this standard.

It is the responsibility of the applicator to ensure compliance with all applicable local, state, and country regulations pertaining to materials or processes referred to in this standard; applicable specifications; or referenced documents that are considered hazardous and may be controlled by environmental, health, and safety regulations.

1.3.3 Digital Materials Research Lab

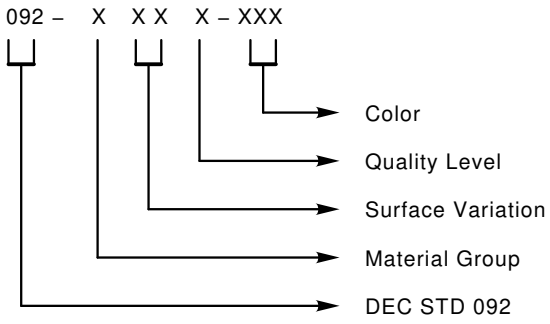
The Digital Materials Research Lab, located in MLO5-1/P55, is responsible for testing and approving the gloss and color of a pre-shipment sample of liquid/decorative paint material from the coating material supplier before its use by in-house processors or vendor-applicators.

1.3.4 Design Services Organizations

Design Services organizations are responsible for the implementation of the finish numbering system defined under heading 2 of this standard.

2 FINISH/MATERIAL NUMBERING SYSTEM

Digital uses a 3-4-3 format number to specify finish or material requirements. For finishes, this number indicates the finish material group, surface variation, quality level, and color. For example:



2.1 DIGITAL STANDARD FINISH NUMBER

The first three characters of every Digital Standard Finish number are always 092, referring to *DEC STD 092-0 Finish and Color Standard— Introduction and General Requirements*.

All three digits are always specified; omission of the leading zero (92) is not allowed. This requirement is necessary to eliminate the possibility of a user misinterpreting a Digital Standard Finish number as a Unified Numbering Code (UNC) 2-5-2 part number. The standard finish number is not a part number. Refer to *DEC STD 012-0 Part Identification Standard* for more information.

2.2 MATERIAL GROUP

An alphabetic character in the first position of the 4-character field of the 3-4-3 format is used to designate the material group. It is always used with a designated surface variation. The following material group letters are assigned.

Group	Material
A	Paints
B	Metal Plating
C	Conversion and Oxide Coatings
D	Molded Plastics
E	Sheet Plastics
F	Inks

2.3 SURFACE VARIATIONS

A 2-digit surface variation number is used to identify a specific surface variation within a material group. The surface variation is only a numbering system; there is no correlation of numbers between material groups. For example:

092-A10x-xxx Smooth Paint Surface

092-B05x-xxx Zinc Plate with Yellow Chromate

Each surface variation shall have a finish specification that specifies the particulars of that finish. The finish specification must be prepared, approved, and controlled in accordance with the requirements of *DEC STD 092-4 Finish and Color Standard—Approved Finish Specifications*.

2.4 QUALITY LEVEL

The five quality levels, designated 1 through 5, are used to specify the required quality for the finish. The level number indicates the application and inspection criteria of a particular finish as:

1. 092-xxx1-xxx

   A *1* is used to indicate that special finish requirements require optical devices or other special inspection instruments as specified on the part's engineering drawing.

2. 092-xxx2-xxx

   A *2* is used for high-quality decorative parts, such as control panels, logos, and silk-screening that are exposed in highly-visible areas of Digital products.

   Quality level 2 parts shall be inspected for finish quality from a viewing distance of 18 inches (457 mm).

3. 092-xxx3-xxx

   A *3* is used to specify finish quality for parts that are occasionally exposed, such as control panels.

   Quality level 3 parts shall be inspected for finish quality from a viewing distance of 36 inches (914 mm).

4. 092-xxx4-xxx

   A *4* is used to specify finish quality for external parts, such as textured panels and housings.

   Quality level 4 parts shall be inspected for finish quality from a viewing distance of 48 inches (1219 mm).

5. 092-xxx5-xxx

   A *5* is used to specify the finish quality for parts that are inside the cabinet or chassis, or the inner surface of exposed parts.

   Quality level 5 parts shall be inspected for finish quality from a viewing distance of 60 inches (1524 mm).

NOTE

The applicable part drawing shall specify if more than one quality level is required.

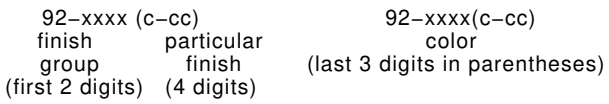
2.5 COLOR 092-XXXX-XXX

The finish color is specified by a 3-digit number in the last three positions of the 3-4-3 number. The currently approved color codes are listed numerically in *DEC STD 092-5 Finish and Color Standard—Digital Color List*.

3 PREVIOUS NUMBERING SYSTEM

The finish numbering system defined by this standard replaces all previous versions of 92-class numbers assigned to paints and finishes.

The previous numbering system provided three groups of information. *92* was the designation for all finishes. The first four digits in the second field designated specific classes or types of finishes. The last digit of the second field and the two digits of the third field designated color. For example:



These numbers appeared on all drawings of hardware [either in 92-xxxx(c-cc) or 92-xxxxc-cc format] to describe the specific type of finish and the appearance quality desired for the part or assembly.

Existing engineering drawings and documents that use the previous numbering system for paints and finishes shall only be changed if specified by an ECO. All new drawings and documents prepared after 05-Nov-1981 shall use the finish numbering system defined under heading 2.

Table 1 provides a cross-reference listing of previously used finish numbers and their equivalent new Digital Standard Finish numbers. Note that *(x-xx)* indicates color.

Table 1: Obsolete Finish Identifiers—Cross-Reference List to New Identifiers

Number	Name	Old Format	New Format
Spec-01	Textured Paint	92-0015(x-xx)	092-A154-xxx
Spec-02	Semi-Gloss Baked Enamel	92-0011(x-xx)	092-A113-xxx
Spec-03	Not Used		
Spec-04	Baked or Air Dry Enamel	92-0012(x-xx)	092-A125-xxx
Spec-05	Not Used		
Spec-06	Zinc-Chromate Lacquer	92-0006(x-xx)	092-B065-xxx
Spec-07	Zinc-Chromate	92-0007(x-xx)	092-B075-xxx
Spec-08	Not Used		
Spec-09	Not Used		
Spec-10	Decorative Panels (Exposed)	92-0010(x-xx)	092-A102-xxx
Spec-11	Decorative Panels (Usually Unexposed)	92-0011(x-xx)	092-A113-xxx
Spec-12	"Inside the Cast" Finished Parts	92-0012(x-xx)	092-A125-xxx
Spec-13	Finished-Exposed Castings	92-0013(x-xx)	092-A134-xxx
Spec-14	Finished-Unexposed Castings	92-0014(x-xx)	092-A145-xxx
Spec-15	Textured Paint	92-0015(x-xx)	092-A154-xxx
Spec-16	Not Used		
Spec-17	Not Used		
Spec-18	Not Used		

Table 1 (Cont.): Obsolete Finish Identifiers—Cross-Reference List to New Identifiers

Number	Name	Old Format	New Format
Spec-19	Not Used		
Spec-20	Chemical Conversion Coatings	92-0020(x-xx)	092-C205-xxx
Spec-21	Silk Screen on Baked Enamel	None	
Spec-22	Not Used		
Spec-23	Not Used		
Spec-24	Not Used		
Spec-25	Surface Preparation (Steel)	92-0025(x-xx)	092-C255-xxx
Spec-26	Not Used		
Spec-27	Gold Plating (Proprietary)	92-0027(x-xx)	092-C270-xxx
Spec-28	Surface Preparation (Castings)	92-0028(x-xx)	092-C285-xxx
Spec-29	Not Used		
Spec-30	Not Used		
Spec-31	Not Used		
Spec-32	Not Used		
Spec-33	Not Used		
Spec-34	Not Used		
Spec-35	Anodizing of Aluminum (Sulfuric Acid Process)	92-0035(x-xx)	092-C354-xxx
Spec-36	Anodizing of Aluminum (Chromic Acid Process)	92-0036(x-xx)	092-C364-xxx
Spec-37	87-D (Proprietary by Vendor)	92-0037(x-xx)	092-C374-xxx
Spec-38	Black Anodizing (Sulfuric Acid Process)	92-0038(x-xx)	092-C384-xxx
Spec-39	Hardcoating of Aluminum	92-0039(x-xx)	092-C394-xxx
Spec-40	Surface Preparation (Molded Parts)	92-0040(x-xx)	092-A404-xxx
Spec-41	Painted Molded Parts (Exposed)	92-0041(x-xx)	092-A413-xxx

4 APPEARANCE QUALITY CRITERIA

4.1 GENERAL REQUIREMENTS

4.1.1 Workmanship

The finish and finished parts shall be clean, neat, and comply with applicable drawings and specifications. Any corrosion of the base material shall be considered unacceptable.

4.1.2 Packing and Preservation

Before, during, and after the finishing process, the parts shall not be subjected to any hostile environments that may affect the appearance or function of the finish.

Items shall also be packaged to protect the finish and the parts during normal handling and transporting operations.

Packaging shall be of good commercial quality and designed to ensure finished part arrival at the end user site in an undamaged, usable condition.

4.1.3 Finish Operation Marks

Operation marks caused by the finishing process are acceptable, provided they are uniform and exhibit good workmanship quality, are not in a critical appearance area of the product, and have been approved by the responsible Digital engineering group.

4.1.4 Defects

No appearance defect shall be allowed to affect the functional properties of the finish, regardless of its appearance at any viewing distance.

4.2 APPEARANCE

When a finish is viewed from the required distance, the finish shall not exhibit any imperfections, blemishes, or differences in color or texture that will cause the viewer to immediately focus on the affected area.

4.3 LIGHTING AND VIEWING CONDITIONS

The following lighting and viewing conditions shall be used for all inspections of appearance quality.

4.3.1 Light Source

The light source shall be a cool white fluorescent lamp with uniform illumination and intensity between 100 and 125 foot candles (between 1076.4 and 1345.5 lumens per square meter).

4.3.2 Geometric Conditions

The lighting shall be primarily from an overhead source. The surface under inspection may be viewed at an angle between vertical and 45 degrees to allow perception of the surface.

4.3.3 Inspection Procedure

The inspector shall scan the surface in a continuous manner. Any obvious defects, such as color or texture mismatch, shall be rejected. All judgments shall be made from the specified viewing distance.

NOTE

It is acceptable to determine a texture and/or color match at a viewing distance other than that specified, if deemed necessary by quality control. This distance shall be a normal and comfortable viewing distance.

5 SPECIFYING FINISH TYPE

Digital finish specifications identify the specific types of finishes acceptable for use on Digital products. These specifications provide the Digital Standard Finish number, a description of the finish type and its use, any substrate limitations, and the appearance quality criteria. The desired finish for the part is specified by the insertion of the finish specification number 092-xxxx-xxx including the desired color designation (xxx from subhead 2.5) in the *Finish* block on the hardware parts drawing.

NOTE

For finishes that do not have a specification, testing is required prior to use on Digital products.

6 GENERAL FINISH RULES

The following general finish rules shall be applied during the finishing process, unless otherwise specified by the engineering documentation for a specific part.

6.1 DRAWING COMPLIANCE

All drawing requirements shall be met after finish application, unless otherwise specified on the drawing. Finishes shall be in accordance with the finish specifications listed in DEC STD 092-4. Unless otherwise specified, dimensions shall apply after the application of inorganic finishes (such as plating, chromates, and oxides), but before the application of organic finishes (such as lacquers, varnishes, and enamels). Any specified machined surface quality shall be inspected before the application of any type of finish.

6.2 METAL PARTS

All metal parts shall be painted with a baked paint, unless otherwise specified on the related drawing or unless baking temperatures affect the mechanical properties of the substrate.

6.3 NON-METAL PARTS

When paint is specified, all non-metal parts that are permanently fixed, or have only one surface that is normally visible on the outside of the cabinet, need only be painted on that visible surface and its adjacent edges. These surfaces may be painted either smooth or textured. Refer to the specific drawing for the part in question.

6.4 THREADED HOLES OR FASTENERS

Threaded holes or fasteners on finished parts do not have to be masked prior to finishing unless so specified on the drawing. However, in all cases the fastener or threaded hole must accept the applicable thread gauge, unless otherwise specified.

6.5 HOOK CONTACT POINTS

Hook contact points that do not interfere with further finish or processes (such as silk-screening) are allowed, provided they are not more than 1/8 inch in area and do not degrade the finished product.

The number and location area of these points must be approved by Digital.

6.6 TOUCH-UP

6.6.1 Paints

Unless otherwise specified on the engineering drawing or the individual finish specification, all Digital paint finishes shall accept approved touch-up paint with a suitable air-dry lacquer or enamel of a matching color. The touch up must visually blend in as a uniform finish when viewed from the recommended viewing distance for the particular finish. Refer to A-SP-7665303-00-0, *Touch-up Procedure for Air Dry and Aerosol Paints* for more information.

6.6.2 Other Coatings

Touch up of damaged areas is not acceptable and shall be rejected, unless otherwise indicated on part drawings or applicable finish specifications.

6.7 APPROVAL

All materials used on Digital parts must be approved by Digital.

7 GENERAL REQUIREMENTS FOR ALL DIGITAL FINISHES

7.1 ALL FINISHES

The performance of finishes approved for use on Digital products shall be tested in accordance with *DEC STD 092-3 Finish and Color Standard – Finish Material Test Requirements*, the part drawing, and the appropriate finish specification.

The appropriate tests and criteria described in DEC STD 092-3 for the specific finishes and substrate shall be applied to sample test panels to either evaluate a currently approved process or finish or to evaluate and approve a new process or finish. Test panel requirements and uses are described under heading 8.

Test specimens must be cured after the finish process to ensure proper test results, unless otherwise specified. The duration of the post-curing shall be agreed upon by the material supplier, finish applicator, and Digital.

7.2 PAINTS ONLY

In DEC STD 092-3, all test criteria are based upon a smooth paint finish 0.025 mm (1.0 mil) thick, unless otherwise specified.

The use of organic primers is acceptable providing the finish meets all requirements of this standard, the appropriate finish specification, and the part drawing. Primers are not mandatory; therefore, this preparatory coating may be used at the discretion of the applicator, unless otherwise specified.

8 TEST PANELS

8.1 REQUIREMENTS

At the request of Digital, the finish applicator shall furnish a minimum of five test panels of each base material to enable Digital to completely evaluate the paint process or finish according to DEC STD 092-3 and the appropriate finish specification.

Tests to evaluate the painting process shall be performed on panels per the requirements of 092-C250-xxx and 092-A40X-xxx. Test panels shall be 1010CRS, 5052-H32 aluminum, or applicable plastic 4 inches x 6 inches x 0.24 inch (101 mm x 152 mm x 0.610 mm). Plastic thickness shall be 0.125 inch, unless otherwise specified.

For all other coatings and finishes, test panels shall be prepared and finished in accordance with the individual finish specification.

8.2 TEST PANEL INFORMATION

Test panels submitted by the processor shall include:

- Digital Standard Finish specification number
- Substrate material
- Preparation of the test panels
- Material manufacturer's name, in-house finishing line identification or vendor name, if samples are from an outside finisher
- Material manufacturer's batch (lot) number, for paint finishes
- Viscosity reading, for paint finishes
- Baking temperature and time in oven, for baked paint finishes
- Date test panels were coated

APPENDIX A

REFERENCED DOCUMENTS

A.1 Digital Documents

Document Number	Title
EL-00012-00	*DEC STD 012-0 Part Identification Standard*
EL-00092-00	*DEC STD 092-0 Finish and Color Standard—Introduction and General Requirements*
EL-00092-02	*DEC STD 092-2 Finish and Color Standard – Finish Material Standard for Suppliers*
EL-00092-03	*DEC STD 092-3 Finish and Color Standard – Finish Material Test Requirements*
EL-00092-04	*DEC STD 092-4 Finish and Color Standard – Approved Finish Specifications*
EL-00092-05	*DEC STD 092-5 Finish and Color Standard – Digital Color List*
A-SP-7665303-00-0	*Touch-up Procedure for Air Dry and Aerosol Paints*

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